

REMARKS

Claims 1-10 are pending in this application. By this Amendment, claims 1-10 are amended. No new matter is added.

Applicants appreciate the courtesies shown to Applicants' representative by Examiners Warden and Cole in the June 19 personal interview. Applicants' separate record of the substance of the interview is incorporated into the following remarks.

I. Formal Matters

In the Office Action, the drawings are objected to for not containing an element "2b." Attached herewith are corrected drawings in which original elements "2B" are changed to elements "2b". No new matter is added.

Withdrawal of the objection is respectfully requested.

In the Office Action, claims 1-10 are rejected under 35 U.S.C. §112, second paragraph. This rejection is respectfully traversed.

Claims 1-10 are amended for clarity to more particularly describe the invention. Claims 1-10 are deemed concise and definite. Withdrawal of the rejection is respectfully requested.

II. Pending Claims 1-10 Define Patentable Subject Matter

In the Office Action, claims 1-6 and 8 are rejected under 35 U.S.C. §102(b) over U.S. Patent No. 5,339,482 to Desimone. Additionally, claims 7, 9 and 10 are rejected under 35 U.S.C. §103(a) over Desimone. These rejections are respectfully traversed.

As discussed during the June 19 personal interview, it is an essential feature of the present invention as defined by independent claims 1 and 8 that the first and second parts "are firmly connected to one another by a shrink fit caused by the injection-molding operation." Further, it is important that the first and second molded parts "do not form a chemical bond

during the injection-molding operation." See Applicants' specification at, for example, page 2, lines 21-30.

As discussed, "shrinkage" is a phenomenon that appears, for example, during injection molding of plastic materials in which dimensions of the plastic molded part diminish either by cooling of the molded part or by chemical reaction, such as hardening of a resin during the injection molding. *why is the chemical and not also cooling*

With the claimed invention, inexpensive plastic material, such as SAN, can be used that previously could not have been used for toothbrushes due to its inadequate resistance to aggressive substances in tooth-cleaning agents. However, with the claimed invention, only the molded part of the toothbrush having the brush head has to be produced from an expensive plastic material that is resistant to such aggressive substances, whereas the part forming at least part of the handle can be made of a plastic material with less resistance.

According to the claimed invention, the firm connection between the two molded parts is formed by the injection-molding operation itself, as a result of the "shrinkage" after the injection operation. As such, there does not need to be an assembling operation in the method, as required by Desimone.

That is, Desimone at col. 2, lines 55-58, col. 5, lines 9-11 and 36-43 requires the separate formation of two molded pieces. Desimone also requires an oversized and "compressible" material in order to achieve a "compression-fit" of the two plastic materials. For example, see Figs. 5-7 and col. 4, line 27 to col. 5, line 34 of Desimone where several embodiments are shown in which a compressible insert 22 is manually or automatically inserted within a handle aperture 36 after the separate molding steps. In particular, see col. 5, lines 15-22 where the resultant structural "compression-fit" is defined. To achieve this fit, Desimone requires that insert 22 is "compressible" and molded to a dimension larger than the aperture 36. Alternatively, Desimone teaches that if insert 22 is hard, then aperture 36 must

be made of a "pliable" material and the insert must be made of a dimension larger than the aperture. See col. 5, lines 25-29. Because of this, only one of the two different materials can be a hard plastic in order to provide an outward urging force that keeps the insert in place. Moreover, because the insert must be dimensionally larger than the aperture in all embodiments, the insert must be formed in a separate process in a separate mold. *or what?*

On the contrary, because the claimed invention uses "shrinkage fitting" of the two different molded parts, both parts can be made of a hard plastic and still achieve a positive connection or fit. Moreover, both molded parts can be formed in the same mold, with the first molded part forming part of the mold for the subsequently molded second part.

As agreed upon during the interview, the claimed method recited in independent claim 8 and claims 9-10 dependent therefrom differ from and appear to be patentably distinct from the wholly different method of toothbrush manufacture provided in Desimone.

Moreover, with respect to independent product claim 1, it is believed that the claimed two part toothbrush having a "shrinkage fit" connection inherently has different structural properties than the resultant brush of Desimone. For example, Desimone requires, as discussed above, that one of the two separately molded parts is "pliable" or "compressible." This is not the case with the claimed product, as evidenced by the various samples presented during the interview where the first and second molded parts can be formed from different hard plastics. For example, one may consist of polypropylene while the other consists of styrene acrylonitrile (SAN) (claim 6) or acrylonitrile-butadiene, styrene, polyamide, polycarbonate or polyester (claim 7).

SAN is an inexpensive hard plastic that would not be considered useable in a toothbrush because of its inferior properties regarding resistance to toothpaste products. However, it is fully acceptable for use in the handle. Because of the claimed process, a resultant toothbrush can be formed with a brush part of a high resistance hard plastic such as

polypropylene (which is relatively expensive) and a handle part of a low resistance hard plastic such as SAN (which is relatively cheap). Thus, not only is there a reduction in processing steps compared to Desimone, but the resultant product can be made cheaper, and of different materials (i.e., two hard plastics). This resultant structure is not attainable by the Desimone process.

Further, the "shrinkage fit" is advantageous in that it prevents "gaps" between the two molded parts into which water or contaminants could penetrate. Such penetration could easily occur in the Desimone structure because of the "compression-fit." Thus, the Desimone structure is inferior for sanitary reasons. It also is structurally different because the claimed "shrinkage fit" after injection molding can eliminate such gaps because all overlap can snugly fit against the inner material. On the other hand, because of the "compression-fit", the middle will have more urging force than the periphery so that although it may prevent removal of the insert 22, peripheral edges may form the "gaps".

not necessarily true

Thus, although similar, there are many subtle structural property differences formed as a result of the inventive process of manufacture that cannot be duplicated by Desimone's disclosed process.

Regarding claim 9, there is no inconsistency of this with the broader claim 8 because claim 8 does not require that the first part partially enclose the second part. Instead, claim 8 requires only that one of the two parts partially enclose the other. Claim 9 then further specifies that the first plastic material has a lower shrinkage than the second. As such, in order for there to be a "shrink-fit" for claim 9, it is clear that the first molded part would have to be the part that partially enclosed the other molded part.

Based on the above, it is believed that independent claims 1 and 8 each define over the applied art and would not have been obvious. As such, these claims and claims dependent therefrom are believed to be allowable.

Withdrawal of the rejections is respectfully requested.

III. Conclusion

In view of the foregoing, it is respectfully submitted that this application is in condition for allowance. Favorable reconsideration and prompt allowance of claims 1-10 are earnestly solicited.

Should the Examiner believe that anything further would be desirable in order to place this application in even better condition for allowance, the Examiner is invited to contact the undersigned at the telephone number set forth below.

Respectfully submitted,



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